Analysis of Cultivating a Software Engineering Community at DLR
(and some insights we gained)

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Software Development at DLR

Numbers

- More than 8500 employees
- ~20% of DLR employees involved in software development

Some Characteristics

- Variety of
  - Fields
  - Maturity
  - Software technologies
  - Team sizes
  - Backgrounds

We started the Software Engineering Initiative for DLR because we believe that our research results profit from better software!

Software Engineering Initiative for DLR

Software Engineering Initiative for DLR

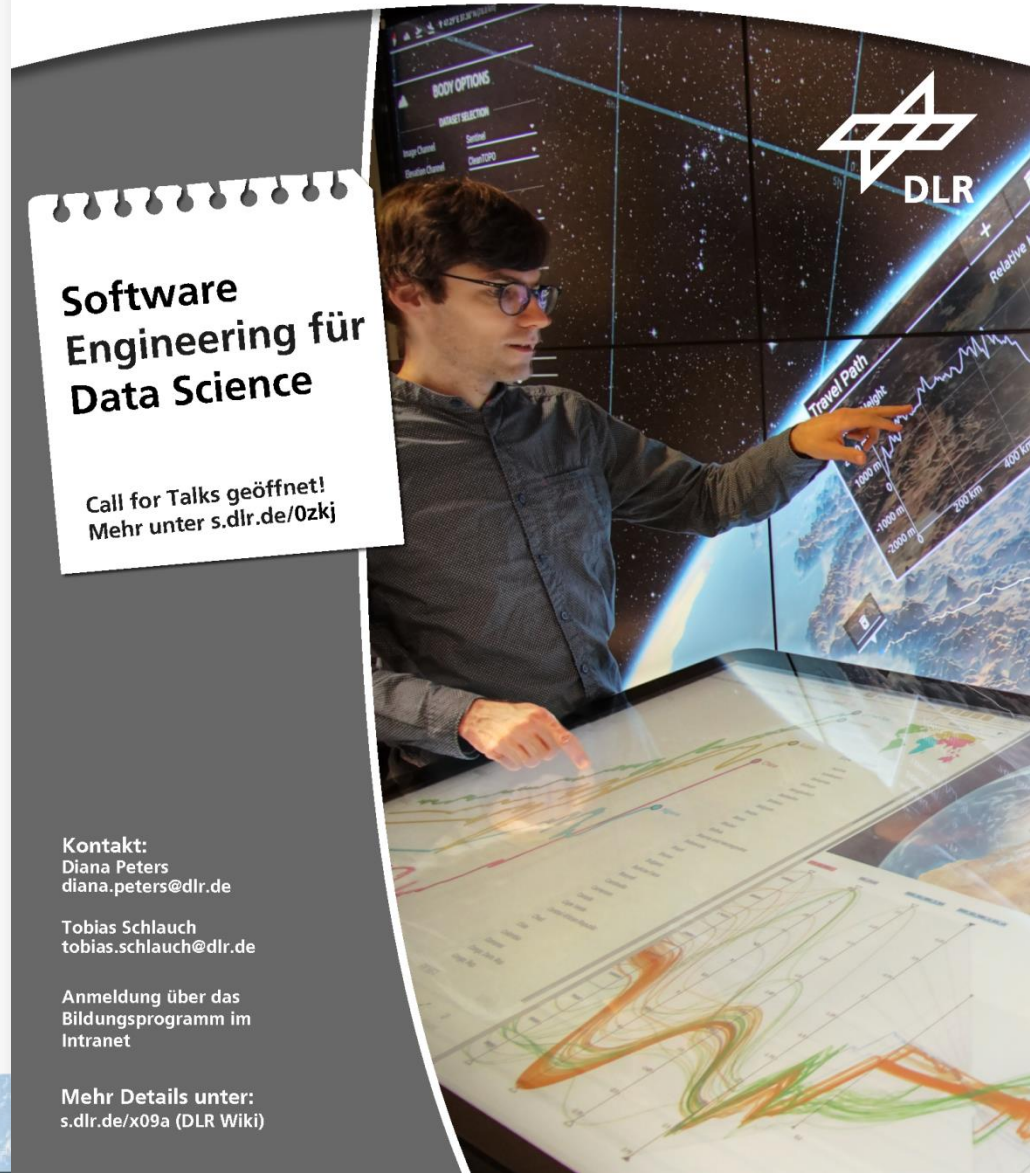
- Policy Development
- Guidelines and Tools
- Trainings and Consulting
- Knowledge and Experience Exchange

Knowledge Exchange Workshops

Regular knowledge exchange workshops are held to actively involve DLR scientists and to foster exchange.

Concept

- Intensive 1.5 day workshop
- Maximum of 60 participants
- Active involvement of the participants
- Knowledge, experience exchange and networking opportunities
- Results are shared via the [SoftwareEngineering.Wiki]



Research Questions

1. How stable is the represented part of the DLR software engineering community?

2. What is the influence of the workshop main topic on the workshop attendance?

3. Where are the workshop participants coming from?

Analysis Approach

Idea:

- Analysis of the participation data of the 6 WAWs on Software Engineering

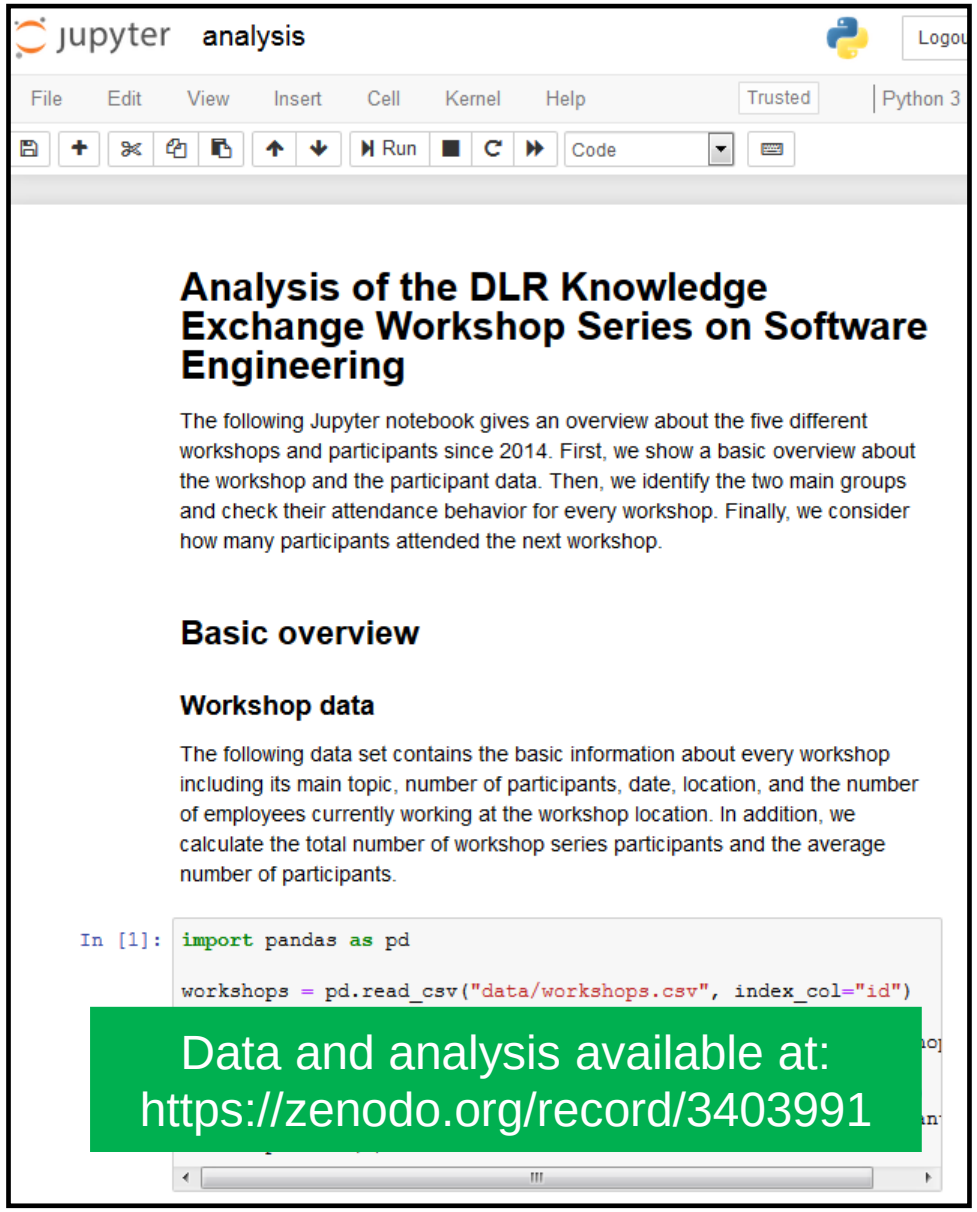
But it is just looking at attendance lists, right?

- But: Unavailable or incomplete attendance lists, multiple registrations, name changes, location normalization, etc.

Presented results are:

- Based on (as good as possible) cleaned up and anonymized participation and location data sets

- Created with the help of great tools such as Python, Jupyter Notebook, Pandas, Matplotlib, Seaborn ☺



Overview

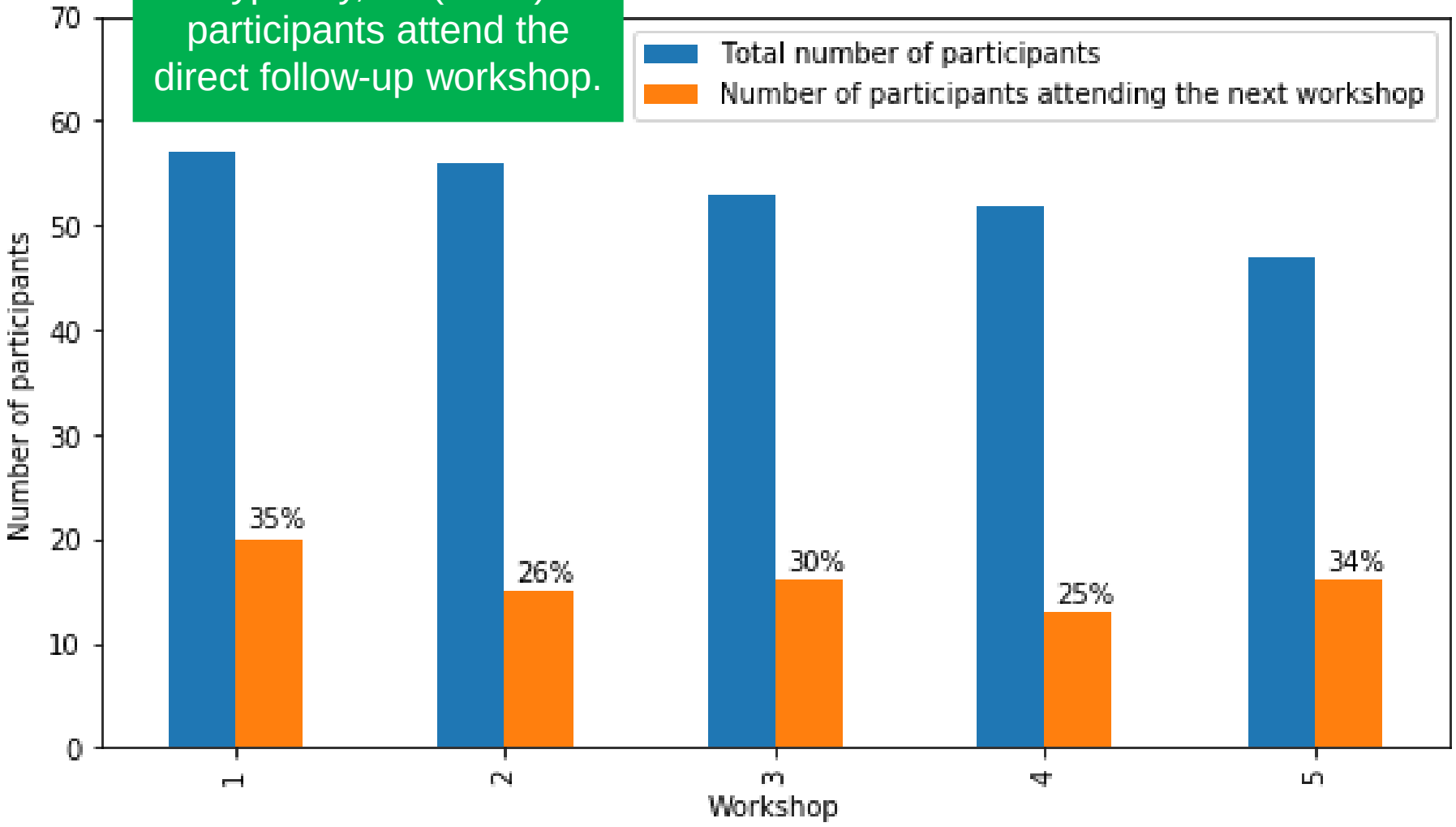
Overall:

- 320 participants
- 223 unique participants
- 53 participants per workshop in average

#	Topic	# Participants	Date	Location	# Employees at Location
1	Kick-Off	57	November 2014	Braunschweig	1140
2	Tools and Processes	56	April 2015	Cologne	1581
3	Open and Inner Source	53	April 2016	Oberpfaffenhofen	1692
4	Software Architecture	52	April 2017	Berlin	649
5	Embedded Systems	47	May 2018	Bremen	183
6	Software Engineering for Data Science	55	May 2019	Jena	about 50

How stable is the represented part of the DLR software engineering community?

Typically, 16 (+4/-3) participants attend the direct follow-up workshop.



How stable is the represented part of the DLR software engineering community?

- Attended > 1 workshop
- Skipped <= 1 workshop in a row while still working at DLR

Core group:

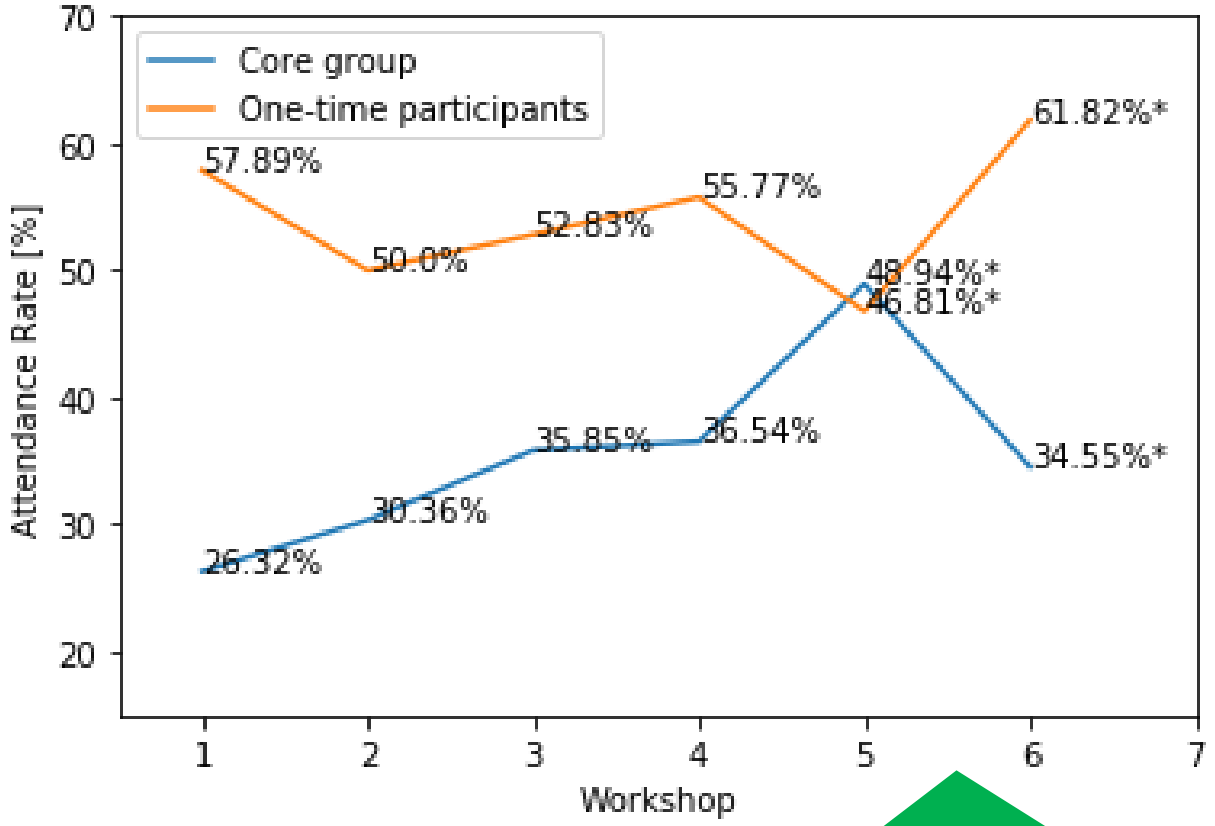
- 15% of unique participants

One-time participants:

- 78% of unique participants
- Including 34 persons of the last workshop that can become core group members.

Infrequent participants:

- 7% of unique participants



* Data of the last two workshops needs to stabilize!

How stable is the represented part of the DLR software engineering community?

	# Core Group
After Workshop 2	20
After Workshop 3	25
After Workshop 4	27
After Workshop 5	29
After Workshop 6	33

How stable is the represented part of the DLR software engineering community?

	# Core Group	# New Core Group Cohort
After Workshop 2	20	20
After Workshop 3	25	3
After Workshop 4	27	6
After Workshop 5	29	2
After Workshop 6	33	7

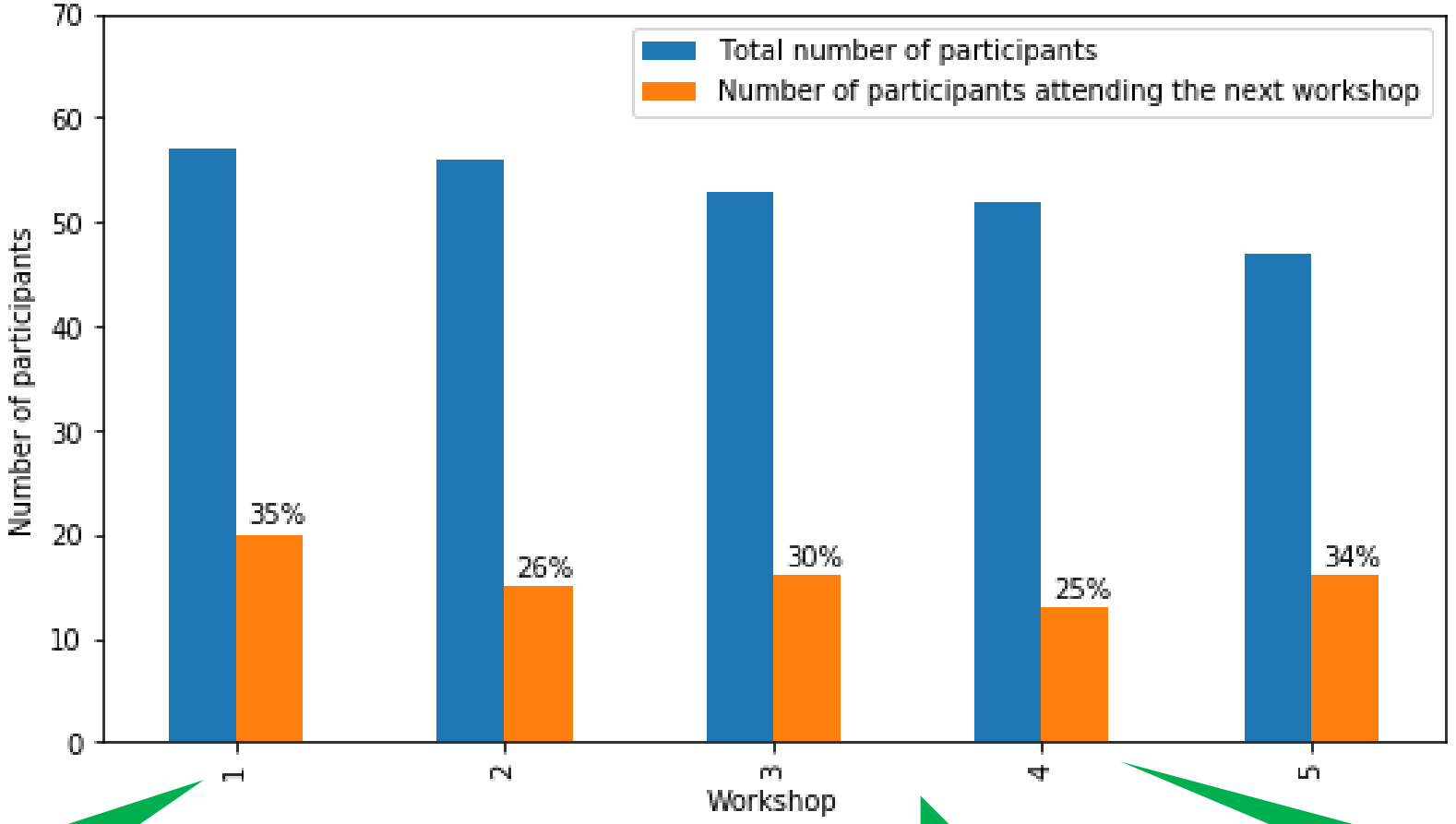
How stable is the represented part of the DLR software engineering community?

	# Core Group	# New Core Group Cohort	# All Workshops visited
After Workshop 2	20	20	20
After Workshop 3	25	3	12
After Workshop 4	27	6	7
After Workshop 5	29	2	6
After Workshop 6	33	7	5

How stable is the represented part of the DLR software engineering community?

	# Core Group	# New Core Group Cohort	# All Workshops visited
After Workshop 2	20	20	20
After Workshop 3	25	3	12
After Workshop 4	27	6	7
After Workshop 5	29	2	6
After Workshop 6	33	7	5
After Workshop 7	?	0 .. 34 ?	?

What is the influence of the workshop main topic on the workshop attendance?



Workshop Topics:

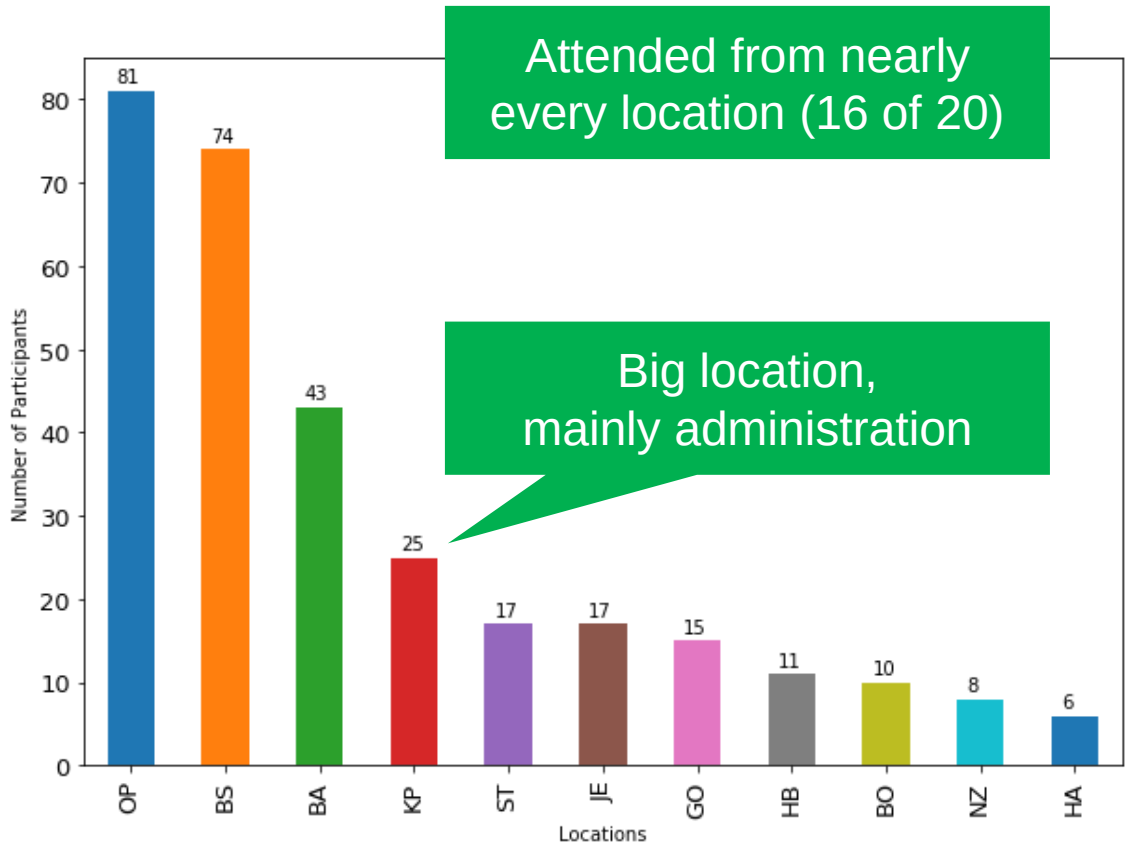
1) Kick-Off
2) Tools and Processes
3) Open and Inner Source
4) Software Architecture
5) Embedded Systems
6) Software Engineering for Data Science

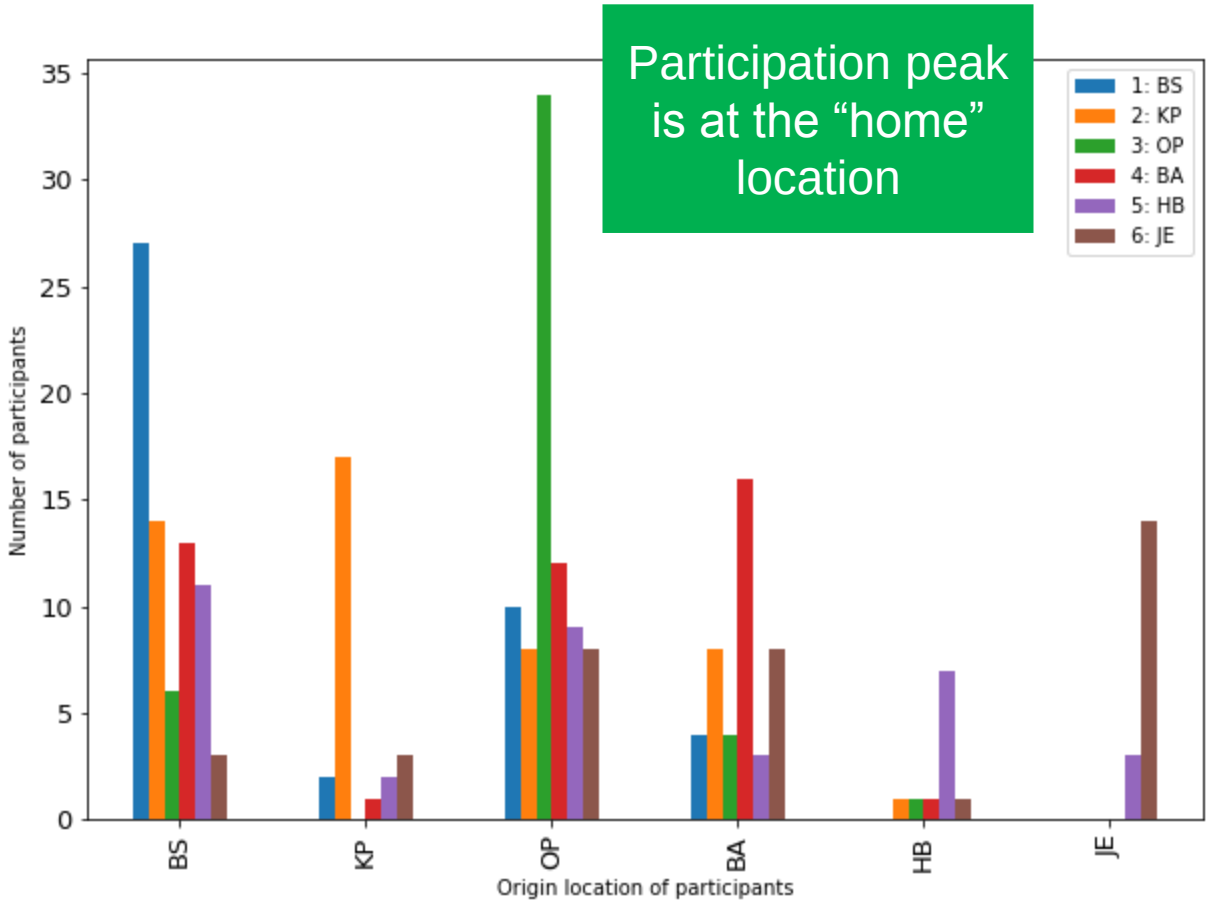
Kick-Off & Follow-Up

Working on identified Topics

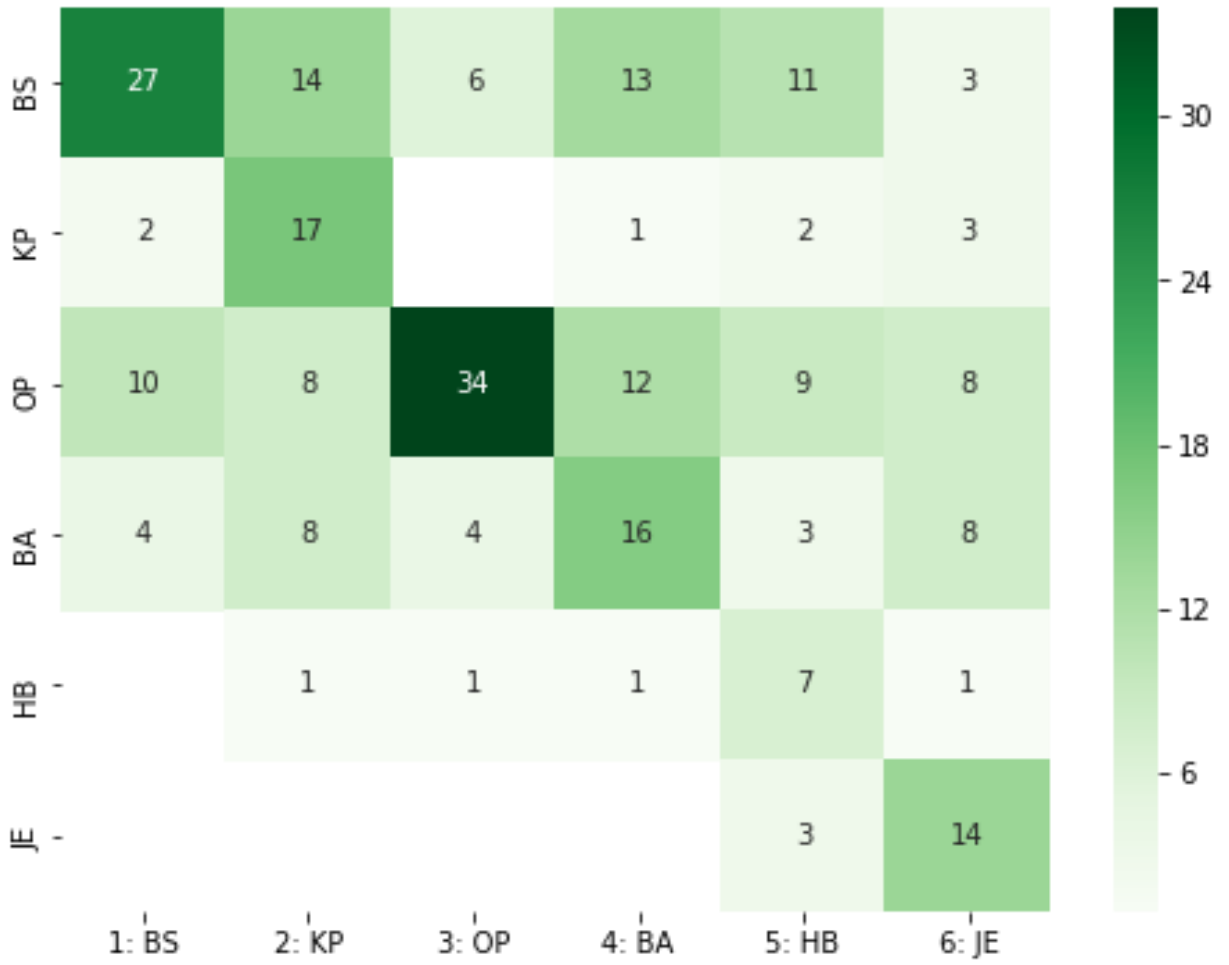
New and specialized Topics

Where are the workshop participants coming from?





Detailed Participation Numbers of Workshop Locations



Workshop Topics:

1) Kick-Off
2) Tools and Processes
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6) Software Engineering for Data Science

Research Questions
Some initial Answers

1. **How stable is the represented part of the DLR software engineering community?**

   In average, 36% community core members, 10% non-regular visitors, and 54% one-time visitors attend a workshop. Overall, the number of core group members is slowly increasing.

2. **What is the influence of the workshop main topic on the workshop attendance?**

   The main topic seems to be an important aspect for participation. We need to be aware with the main topic selection as it seems to influence workshop return rates and core group “onboarding”.

3. **Where are the workshop participants coming from?**

   Participants originate from nearly all DLR locations. Participants primarily attend workshops at their work location. A “smaller” workshop location does not necessarily reduce the overall participation.

Outlook, Ideas & Questions

Outlook & Ideas

- Focus on core SE topics again and RSE
- More involvement of former participants when selecting the main workshop topic
- Perform follow-up surveys and/or interviews

Some open questions

- Do we need a simpler definition of the core group?
- What additional information can we use to better interpret observed effects?

Data and analysis available at:
https://zenodo.org/record/3403991

Thank You! - Questions?

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